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72/W/RN/13 Intensive Cereals - Ley, Potatoes, W. Wheat, Barley

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72/W/RN/13

INTENSIVE CEREALS

Object: To study the effects of intensive cereal cropping on yield, incidence of soil-borne diseases and organic matter in the soil - Woburn Stackyard I.

Sponsors: G.W. Cooke, D.B. Slope.

The seventh year, ley, potatoes, winter wheat, barley.

For previous years see 66/B/9(t), 67/B/9, 68/B/7(t), 69/W/RN/13(t), 70/W/RN/13(t) and 71/W/RN/13(t).

Whole plot dimensions: 8.53 x 20.4. Sub plot area harvested:
Potatoes - 0.00139, wheat - 0.00273, barley - 0.00273.

Basal applications: All crops: 130 kg P2O5, 260 kg K2O as (0:14:28), half ploughed in, half applied to the plough furrow. Weedkiller to all crops except potatoes: Paraquat at 0.56 kg ion in 280 l. Leys: 63 kg N in seedbed, 63 kg N after sowing as 'Nitro-Chalk'. Only one cut was taken.

Potatoes: 150 kg N as 'Nitro-Chalk'. Weedkiller: Linuron at 1.1 kg with paraquat at 0.4 kg ion in 370 l. Fungicide: Mancozeb at 1.3 kg in 430 l. Fungicide with insecticide: Mancozeb at 1.3 kg with demeton-s-methyl at 0.25 kg in 430 l.

Wheat: Weedkiller: 2,4-D at 0.7 kg with dichlorprop at 2.8 kg in 280 l.

Barley: Weedkiller: 2,4-D at 0.56 kg with dichlorprop at 2.2 kg in 280 l.

Seed: Leys: Italian ryegrass S22, sown at 28 kg.

Potatoes: Majestic.

Wheat: Cappelle, sown at 180 kg.

Barley: Julia (dressed with ethirimol) sown at 180 kg.

Cultivations, etc.: All plots: Half PK applied, ploughed: 1 Oct, 1971. Remaining PK applied: 7 Oct.

Leys: Paraquat applied: 9 Sept, 1971. Deep-tine cultivated, wheat block only: 4 Nov. N applied: 18 Apr, 1972. Rotary cultivated: 21 Apr. Seed sown: 26 Apr. N applied: 6 June. Cut once: 6 Sept.

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Potatoes: Deep-tine cultivated, wheat block only: 4 Nov, 1971.
N applied: 4 Apr, 1972. Rotary cultivated, potatoes planted:
18 Apr. Linuron with paraquat applied: 6 May. Rotary ridged:
19 June. Fungicide applied: 5 July. Fungicide with insecticide
applied: 27 July. Haulm mechanically destroyed: 14 Sept.
Lifted: 20 Sept.

Wheat: Paraquat applied: 9 Sept, 1971. Seed drilled: 15 Oct. N
applied: 11 Apr, 1972. 2,4-D with dichlorprop applied: 27 Apr.
Combine harvested: 30 Aug.

Barley: Paraquat applied: 9 Sept, 1971. Seed drilled: 15 Mar, 1972.
N applied: 16 Mar. 2,4-D with dichlorprop applied: 8 May.
Combine harvested: 24 Aug.

NOTE: Estimates of eyespot (*Cercospora herpotrichoides*) and take-all
(*Gaeumannomyces graminis* formerly *Ophiobolus graminis*) were
made on both cereal crops.

Standard errors per sub plot.

Wheat, grain, tonnes/hectare: 0.389 or 16.7% (12 d.f.)

Barley, grain, tonnes/hectare: 0.197 or 4.0% (11 d.f.)

NOTES: (1) One barley plot (CS6, NSO) was severely damaged by birds. The
yield of this plot was not recorded - an estimated value
was used in the analysis.

(2) In 1972 and in 1971 the yields of leys were not recorded.

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TABLES OF MEANS

POTATOES

N: KG/HA 1970

63	126	189	252	Mean
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PERMANENT WHEAT BLOCKS

TOTAL TUBERS: TONNES/HECTARE

32.9	38.1	35.6	36.2	35.7
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PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE

93.1	94.0	94.5	93.4	93.7
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PERMANENT BARLEY BLOCKS

TOTAL TUBERS: TONNES/HECTARE

41.7	40.8	39.4	43.9	41.4
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PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE

95.0	94.8	94.8	95.3	95.0
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WINTER WHEAT

N: KG/HA

CROP SEQUENCE (CS)							63	126	189	252	Mean
GRAIN: TONNES/HECTARE											
	1966	1967	1968	1969	1970	1971					
2	P	W	W	W	L	P	2.10	3.55	3.39	3.81	3.21
3	W	W	W	L	P	W	1.37	2.40	2.55	2.77	2.27
4	W	W	L	P	W	W	1.02	1.91	2.46	2.43	1.95
6	W	W	W	W	W	W	1.16	2.09	2.56	1.76	1.80
Mean							1.41	2.49	2.74	2.69	2.33

STANDARD ERRORS OF DIFFERENCES

N	CS*
N	N
0.194	0.389

* Within the same level of CS only

STRAW: TONNES/HECTARE

	1966	1967	1968	1969	1970	1971					
2	P	W	W	W	L	P	2.05	4.21	4.40	5.03	3.92
3	W	W	W	L	P	W	1.65	3.36	3.34	3.54	2.97
4	W	W	L	P	W	W	1.78	2.79	3.02	2.85	2.61
6	W	W	W	W	W	W	3.02	3.61	3.56	3.61	3.45
Mean							2.13	3.49	3.58	3.76	3.24

Mean D.M. %: Grain: 82.6
Straw: 87.0

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BARLEY

N: KG/HA

CROP SEQUENCE (CS)							50	100	150	200	Mean
GRAIN: TONNES/HECTARE											
	1966	1967	1968	1969	1970	1971					
2	P	B	B	B	L	P	3.83	5.42	6.01	5.78	5.26
3	B	B	B	L	P	B	3.68	5.33	6.01	5.78	5.20
4	B	B	L	P	B	B	3.42	4.99	5.71	5.98	5.03
6	B	B	B	B	B	B	1.92	4.46	5.40	5.22	4.25
Mean							3.21	5.05	5.78	5.69	4.93

STANDARD ERRORS OF DIFFERENCES

N CS*
N

0.098 0.197

* Within the same level of CS only

STRAW: TONNES/HECTARE

	1966	1967	1968	1969	1970	1971					
2	P	B	B	B	L	P	3.05	4.63	5.41	5.28	4.59
3	B	B	B	L	P	B	2.80	3.82	4.64	5.10	4.09
4	B	B	L	P	B	B	2.78	3.77	4.71	5.21	4.12
6	B	B	B	B	B	B	2.43	3.70	5.00	5.15	4.07
Mean							2.76	3.98	4.94	5.19	4.22

Mean D.M. %: Grain: 85.6
Straw: 84.9